Coldwater Fisheries Management Plan



New Jersey Department of Environmental Protection
Division of Fish and Wildlife
Bureau of Freshwater Fisheries



James E. McGreevey

Governor

Bradley M. Campbell

Commissioner



State of New Jersey

Coldwater Fisheries Management Plan

James E. McGreevey

Governor

Bradley M. Campbell

Commissioner

NJ Department of Environmental

Protection

John S. Watson, Jr. Assistant Commissioner Natural and Historic Resources

Martin J. McHugh

Director

NJ Division of Fish and Wildlife

David Chanda

Assistant Director

Assistant Director

NJ Division of Fish and Wildlife





GRANT AGREEMENT F-48-R

Investigations and Management of New Jersey's Freshwater Resources

Job II-6 Development of a Coldwater Fisheries Management Plan



This project was paid for by fishing license sales and matching Dingell-Johnson/Wallop-Breaux funds available through the Federal Sportfish Restoration Act.

Principal Authors

Patricia Hamilton, Principal Fisheries Biologist Lisa Barno, Bureau Chief

Contributing Authors

Ed Washuta, Fish Pathologist
Jeff Matthews, Superintendent
Craig Lemon, Superintendent
Mark Boriek, Principal Fisheries Biologist
Robert Papson, Principal Fisheries Biologist

Map Production

Andrea Ostroff, Wildlife Worker

Additional Assistance

Michelle Ruggiero, Seasonal Technician Scott Ward, Seasonal Technician Hugh Carberry, Supervising Biologist Shawn Crouse, Assistant Biologist Christopher Smith, Assistant Biologist Carole Delibero, Principal Clerk Typist

Cover Art

Wendell Ozefovich, Photographer Shawn Crouse, Assistant Biologist

Table of Contents

	Page
Introduction	1
History of Trout Management in New Jersey	3
Trout Life History and Ecology	9
Classification of NJ Trout Waters	29
Management of Habitat	39
Management of Wild Trout	47
Culture of Salmonids	65
Fish Health Management for Salmonids	73
Management of Cultured Trout	87
Allocation Methodology for Cultured Trout	107
Fishing Regulations for Trout	119
Communications and Public Outreach	157
Funding	165
Goals and Strategies	173
Operational Plan	189
Literature Cited	203
Glossary	211

List of Figures

		Page
Figure 1.	New Jersey's trout waters (2004) shown in relation to physiographic provinces.	17
Figure 2.	New Jersey's trout-stocked waters (2004).	18
Figure 3.	New Jersey's trout waters (2004) shown in relation to 1995-97 land use cover.	45
Figure 4.	New Jersey's watersheds and freshwaters having known reproducing salmonid populations (trout production waters) as documented through NJDFW surveys conducted from 1968 through 2003.	50
Figure 5.	New Jersey's physiographic provinces and freshwaters having reproducing salmonid populations (trout production waters) as documented through NJDFW surveys conducted from 1968 through 2003.	51
Figure 6.	Distribution of wild brook trout in New Jersey as documented through NJDFW surveys conducted from 1968 through 2003.	53
Figure 7.	Distribution of wild brown trout in New Jersey as documented through NJDFW surveys conducted from 1968 through 2003.	55
Figure 8.	Distribution of wild rainbow trout in New Jersey as documented through NJDFW surveys conducted from 1968 through 2003.	57
Figure 9.	Distribution of wild lake trout in New Jersey as documented through NJDFW surveys conducted from 1968 through 2003.	59
Figure 10.	New Jersey's trout-stocked waters for spring 2004.	95
Figure 11.	New Jersey's trout-stocked waters for fall 2003.	97
Figure 12.	New Jersey's trout-stocked waters for winter 2003.	100
Figure 13.	New Jersey waters designated as <i>Trout Stocked Waters Having Closed In-season Stocking Dates</i> , in 2004.	131

List of Figures (continued)

		Page
Figure 14.	New Jersey streams designated as <i>Wild Trout Streams</i> , in 2004.	135
Figure 15.	New Jersey streams designated as Year Round Trout Conservation Areas, in 2004.	139
Figure 16.	New Jersey streams designated as Seasonal Trout Conservation Areas, in 2004.	143
Figure 17.	New Jersey streams designated as Fly Fishing Only Areas, in 2004.	147
Figure 18.	New Jersey lakes designated as Trophy Trout Lakes in 2004.	150
Figure 19.	New Jersey lakes designated as Holdover Trout Lakes, in 2004.	153
Figure 20.	New Jersey waters designated as Boundary Waters, in 2004.	155

List of Tables

		Page
Table 1.	Timetable for trout spawning and egg development (Taken from Hamilton and Minervini 1983).	11
Table 2.	Dissolved oxygen concentration at 100% saturation for water temperatures associated with trout streams.	14
Table 3.	A summary of some effects of pH on salmonids and other aquatic organisms (modified from National Academy of Sciences 1973).	19
Table 4.	Incidence of occurrence of selected species in association with naturally reproduced trout (revised 1973).	34
Table 5.	Land area, total stream length and proportion of trout production streams for each watershed management area in New Jersey.	49
Table 6.	Factors and Associated Criteria used to Determine Spring Trout Allocations for New Jersey Trout-Stocked Streams.	113
Table 7.	Factors and Associated Criteria used to Determine Spring Trout Allocations for New Jersey Trout-Stocked Lakes and Ponds.	114
Table 8.	Calculation of individual trout allocations – a 3 step process.	115
Table 9.	Annual spring baseline and constant used to adjust individual raw pre-season and in-season trout allotments in order to achieve the spring baseline figure.	118
Table 10.	Cost of resident freshwater fishing licenses and trout stamps by year.	167
Table 11.	New Jersey freshwater fishing license and trout stamp requirements and fees, in effect during 2004. Licenses and stamps are valid from date of purchase to December 31 st , unless otherwise indicated.	168

List of Appendices

		Page
Appendix A.	New Jersey Division of Fish and Wildlife Field Data Sheets	A - 1
Appendix B.	Classification of New Jersey Waters as Related to Their Suitability for Trout, December 2003	B - 9
Appendix C.	Pequest Trout Hatchery And Natural Resource Education Center — Access Guidelines	C - 39
Appendix D.	Plan for Utilization of Hatchery Surplus Trout	D - 41
Appendix E.	Trout-stocked waters database and allocations for 2003.	E - 45
Appendix F.	Waters Stocked With Trout by the New Jersey Division of Fish and Wildlife	F - 57
Appendix G.	Inventory of Waterbodies for Coldwater Management (Existing and Potential)	G - 67

Introduction

New Jersey's coldwater streams and lakes come in a variety of shapes and sizes and offer an array of habitats for animal, plant and microbial life. Fish species such as trout, that inhabit waters with relatively cold temperatures, $4-15^{\circ}$ C ($40-60^{\circ}$ C), are often referred to as coldwater fishes. The emphasis in this plan is placed on managing salmonid (trout) fisheries because they are widely recognized as indicators of high water quality and are important recreational game fish. Efforts to conserve, protect, and manage trout and their habitats are beneficial not only to other aquatic organisms that co-exist with trout, but to downstream biotic communities as well.

The New Jersey Division of Fish and Wildlife is the primary agency entrusted with protecting and managing the state's fish and wildlife. Trout management in New Jersey dates back to the late 1800's when the New Jersey Fish Commission planned to re-stock natural trout streams believed to have been decimated by a severe drought. The state's first fish hatchery was constructed in 1912 to produce trout in response to a growing demand. Since that humble beginning, trout management within the state has evolved into efforts to protect water quality and in-stream habitat from widespread development and enhance seasonal and year round trout fishing opportunities for anglers through two modern fish culture facilities. Anglers help support agency research and management activities through the purchase of fishing licenses. While many of the Division's management efforts benefit the angler, the state's eight million residents also reap the benefits of resource protection and preservation efforts. In addition, the pursuit of freshwater fishing in New Jersey generates over 138 million dollars annually into the state's economy.

Despite the long history and evolution of trout management within the state there has never been a long term, strategic plan formulated to address the myriad of issues surrounding the state's fragile coldwater resources. The lack of long range goals and objectives leads to a "reactionary" approach to fisheries management. Considering that New Jersey is the fourth smallest state in the union, the most densely populated, and is currently undergoing rapid changes in land uses the development of such a plan is crucial to providing for the long term protection of coldwater resources and providing for its most optimal use. The plan also coincides with the Department's on-going initiative in protecting the state's waterways. This initiative most recently resulted in substantially increasing buffers on trout production streams through changes in Stormwater Management rules. These rules, the most comprehensive and protective of any state's, protect the water quality and critical habitat of important indicator species such as trout.

For the first time an information base pertaining to New Jersey's trout resources has been compiled into one reference document. This information will be useful to a broad audience that includes resource managers and regulators, anglers, conservation organizations, and landowners. Not only does this plan document the evolution of trout management practices over the last century, but it also identifies coldwater issues, goals and strategies in the areas of fish culture, habitat protection, fish health, regulations and stocking practices. Most importantly, it also provides a mechanism for implementing

these strategies by establishing an operational plan. This plan is not static and should be considered a work in progress, subject to change as warranted by changes in environmental or social pressures on New Jersey's coldwater resources, or advances in fisheries management techniques.